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ABSTRACT

The ultimate aim of the Workshop on Women in Science and Technology was to stimulate parents and daughters to explore technical and scientific careers. Approximately 100 men and women from diverse organizations (industry, governmental agencies, non-profit institutions, Federal and State agencies, public schools, special vocational schools, advisory committees, women's organizations, and universities) attended the forum. The focus of the program was primarily on secondary schools and employing institutions in that they seemed most directly related to women's occupational decisions and opportunities. The employer's contribution to the supply of women in technical and scientific occupations was perceived as the attraction and retention of women employees and communication and interaction with educational and other institutions. Participants emphasized that the secondary schools' objectives are not and should not be limited to occupational preparation; students need to become aware of manpower projections, demographic factors, combining family/work roles, women in the labor force, and continuing education. Specific suggestions are directed to school administrators, teachers, counselors, parents, and peer groups. The report includes a summary of the remarks of workshop speakers representing the areas of: employment (management viewpoint), labor force, education, and psychology and counseling. (EA)

ED 095293

WOMEN IN SCIENCE AND TECHNOLOGY

A REPORT ON AN MIT WORKSHOP

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Women in Science and Technology

A Report on the Workshop on Women in Science and Technology, held May 21, 22, and 23, 1973, at the Massachusetts Institute of Technology, Cambridge, Massachusetts

Prepared by
Edith Ruina, Staff Director
Workshop on Women in Science and Technology

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Editor's Note

High school is the last formal education for most women. Regardless of whether they go directly to work after high school or pursue further education, they are likely to choose "women's jobs." Relatively few girls carefully consider their future careers and the full range of options. Unless they do so before the end of high school, women will continue to settle for lower status and achievement than men, and the situation will be worse for women from poor families who have little formal education.

In the spring of '73, several issues converged to lead MIT to organize the Workshop on Women in Science and Technology—concerns about women's education and their role in the work force, students "turned off" by technology when major societal problems associated with energy, transportation, and health care required a continuous supply of skilled labor, and the recognition of the need for better linkages between education and work. The focus was primarily on secondary schools and employing institutions because they seemed most directly related to women's occupational decisions and opportunities. But each individual and each institution has to do "her thing" and the particular emphasis of this Workshop certainly relates to only a piece of the total context that influences girls' aspirations and achievements. Fathers and mothers, elementary school teachers, peers, the media, all of whom sometimes purvey the traditional restrictive attitudes that they learned, can become change agents also.

The Workshop did not consider specific occupations in any detail, but the ultimate aim was to stimulate parents and daughters to explore technical and scientific careers. Just as it was possible to add dimension by artful design to the cover portrayal of the female symbol, so should it become increasingly possible for women to add depth to their lives by considering careers in technology or science, many named in the black type on the white ground. Women might want to combine such work simultaneously with their work as wives and mothers. Detailed information about occupations can be obtained from some of the reliable organizations listed here in Section 6. Since people with varying amounts of educational preparation—high school, technical schools, college, professional schools—are essential to perform the full spectrum of work in our technological society, we have included an array of resources.

I think that by now there is considerable consensus on developing greater opportunity for women. Everyone of us has been touched by some manifestation of the need—wives' or daughters' conflicts, the media, the political activity associated with the women's movement, the large number of women already in the work force, personal experience as women. What reservations persist often arise from genuine uncertainty about how to evolve strategy and tactics that will not adversely affect others—the rearing of children and family relationships, for example, or members of the current work force who must include new entrants. There is no such thing as *a solution* to such fundamental questions; rather they call for a continuous process of accommodation among individuals, institutions, and societal values. The Workshop was one

example of a way to join forces with an on-going process of change. It brought together people whose worlds do not generally intersect and their suggestions, summarized in this publication, deal largely with how to stimulate and expand interaction among educators and employers. Even when personal attitudes about equal opportunity lag, individuals can be expected to cooperate in their institutional behavior.

My own feeling is that people are being asked to grow and to modify their attitudes and behavior in ways that they would want to anyway. They may resist initially, as I discovered when I was telephoning invitations to the Workshop. Almost automatically, I would be referred to *the* senior woman in the organization *if* she existed. It was easier to interest women than stout-hearted male executives in schools and in corporations. But when the men came, they seemed to do so not for philanthropic reasons, but because they were worried about their own relationship to this pressing human resource problem and appreciated a comfortable atmosphere where they could argue about and work on improving women's lot in their institutions.

Laya Wiesner provided the original inspiration for the Workshop and continued as an equal partner in virtually every aspect of its planning and execution. Her previous experience with educational issues and her insights into the problems of women and of organizational processes were reflected in the evolution of this project. Throughout, she demonstrated her will to exercise and to expand the creative potential of her work in the role of wife of the president of MIT.

This report constitutes the only tangible token of our appreciation to participants in the Workshop, to the generous people at MIT, secondary schools, corporations, and government agencies who cooperated in defining its substance and constituency, and to the Carnegie, General Electric, and Sloan Foundations.

My deepest personal gratitude goes to Nadine Rodwin for her intellectual contributions, hard work, and her friendship; to Chancellor Paul Gray for his quiet confidence in this endeavor; to Jack Ruina, who husbanded my resources; and to Rachel, our eleven-year-old daughter, who bore her latch key with grace from January to June of 1973, and who promises to grow up to be a compassionate liberated person.

Edith Ruina

Introduction

How can a girl grow up to be a technician, engineer, or a scientist? Providing girls with the guidance and incentives to take skilled positions in science and technology is a major responsibility of educators and employers. How can teachers, human resource experts, government, universities, and women's organizations contribute to increasing career options for women?

The reasons for the virtually token representation of women in the skilled trades and professions are numerous and complex. To consider them, and to develop some tactics for promoting more opportunities for women, about one hundred men and women from diverse organizations, invited by the Massachusetts Institute of Technology, participated in a Workshop on Women in Science and Technology, held May 21, 22, and 23, 1973, on the campus.

Jerome Wiesner, President of MIT, summarized some of the Workshop's objectives in his welcoming address to the participants:

"You've come here today from a wide range of organizations, probably as wide a range as has ever been represented in such a forum, from industry, governmental agencies, non-profit institutions, federal and state agencies, public schools, special vocational schools, advisory committees, women's organizations, and universities. I'm sure you all have different perspectives on the issue of women in science and technology, and you will return to responsibilities which touch this issue in a very different way. It has been our experience in the past and our hope for these few days that your perspectives can be shared and that together you can shed light on the ways in which many kinds of organizations acting together can change, can increase and open up opportunities, for women in science and technology.

"MIT has rich experience in bringing together people from government, industry, and the academy to take the first steps in developing that quality of understanding and communication and cooperation which can ultimately result in a commitment to new programs and the creation of new and more adaptable institutional forms and practices, as well as facilitating the all-important personal relationships between individuals particularly concerned with the problem at hand. MIT is working within its own structures to develop the human resource that women represent, and we hope this Workshop can help expand efforts in secondary schools and in employing institutions to encourage women's participation in every aspect of our technological society. This is another front in the almost universal battle for equality of opportunity."

President Wiesner emphasized that there should be "concern not just for the vocational aspects of education, science, and technology, which are the dominant focus of the Workshop, but for the general level of *scientific and technological literacy* in our nation which would be well served if these activities become customary academic and career choices for large numbers of women."

This report describes the Workshop and summarizes its proceedings.

1 Women and Work Today

"The average woman worker today is married and 39 years old. Over 50 percent of women aged 45-54 are now working."

A bare three percent of the people in the skilled trades are women, though they comprise nearly forty percent of the paid work force, about thirty-two million workers. Only about one percent of the engineers are women. Over seventy percent of women are in traditionally female occupations: clerical, sales, and teaching. They are seldom in management positions even in fields where they are represented in greater numbers than men—in education, for example. Although about eighty percent of elementary teachers are women, most principals are men.

"Physicists, mathematicians, and engineers are expected to be in short supply by the end of the decade, and the Department of Labor predicts an over-supply of life scientists in the making. However, the life sciences are the most popular of all scientific careers women pursue."

These two issues—the meager representation of women in the skilled trades, science, and engineering, and the infrequency with which women advance to management—describe many aspects of the problem facing educators and employers who seek to expand career choices for women. Before taking a skilled job, a girl must be trained for it; but most vocational programs, for example, have enrolled only boys, and girls do not even think of training for these "men's jobs." The level of seniority women tend to achieve in the professional and managerial hierarchies points to much the same problem, though in a different way. It is common practice for employers to "groom" young men for leadership positions, while overlooking an equally well-educated and competent woman.

Economic forces, education, family, and other social factors all have an impact on women's perception of career opportunities for themselves and society's utilization of them. These reinforce each other and often become self-fulfilling prophecies that restrict opportunities. Perhaps part of the current problem stems from one of the most common approaches to solving it: isolating and studying individual factors. Consequent analyses and actions often reflect the interests of one social group and fail to elicit cooperation from other sectors. Hence, it becomes very difficult to develop comprehensive plans to change the education and employment situation for women. There is growing recognition of contradictory cultural messages to girls that do a disservice to their full humanity by structuring role expectations too narrowly. Elementary and secondary schools must scrutinize their environments for direct and indirect ways role assignments are made and vocational counseling is offered.

The urgency of diversifying women's participation in the labor force grows out of the rapid pace at which changes are taking place in our technological era. Manpower projections, though not foolproof, indicate a rising need for technically competent workers at every level of education and training. The homemaker's role and family structure are evolving so that most women need to work for the same compelling economic reasons

"We face 50 or 100 years of women staying where they are if we don't face up to the supply side of the equation."

"Women have to learn that they can't rely on law; that's only a beginning. There has to be negotiation, monitoring, bargaining: lessons from the trade unions."

"Most women in the labor force will work 25 years or more."

as do men. Families are getting smaller, and women have less to do at home. Divorce is much more common than it used to be, and women often need to support their children as well as themselves.

Men as well as women are seriously questioning the roles they grew up believing they would assume. This trend is part of a nearly universal thrust toward greater equality for all people, socially, economically, and politically. It emphatically provokes reassessment of the preparation of women for contemporary life.

Many employers, however, question the benefits to them of equal opportunity plans for women, and tend to comply just minimally with legal requirements. Few employers are persuaded of the need for child care services and for modification of work schedules and employee benefits to meet the needs of working wives and mothers. Also, there are few incentives for employers to introduce such changes; so most do not. In fact, employers tend to react in the opposite way: in a tight economic situation they lay off women before men. The reverse should not be true, but this situation is clearly unequal.

These circumstances pose serious obstacles to women who could otherwise choose to sustain their commitment to both their work and their families. If a woman has to leave work in order to raise children, her professional worth diminishes because home-based or volunteer activities are not considered credentials for paid employment. Because most women still want families, and most men still want families, both are faced with a complex problem neither can solve alone.

Employers and educators now have the obligation and the opportunity to intervene in the cycle that restricts women's career choices. Programs devised separately or through cooperative efforts can increase women's incentive to prepare for and commit themselves to any career at all, and to careers in science and technology, in particular. Increasingly, public policy expressed in legislation and executive action affirms the collective desire for equal opportunity for all individuals, but designs for implementation in varied institutional settings are necessary to effect the kind and quality of change that is called for.

2 The Format of the Workshop

"Cohesion, friction, energy, and lassitude ebb and flow in these circumstances."

Many participants felt the format of the MIT workshop contributed to its success and might suggest a model for other workshops designed to stimulate thought and action about new career options for women. To accommodate the heterogeneity of the group, which was one of its most outstanding features, some plenary sessions were held, and common grounds for discussions were established. The moderators of the plenary sessions were Elting Morison, MIT; Michael Maccoby, Institute for Policy Studies; and Joan Wofford, Organization for Social and Technical Innovation.

"Workshops such as this are a special effort to meet contemporary needs and should be out of business in 15 years."

The first day plenary session included brief presentations by eight speakers from industry, research, education, and career counseling. Frank Toner and John Kingsbury described the efforts being made by two major employers of the technically trained labor force to eliminate the sex bias traditional in many jobs. Phyllis Wallace and Betty Vetter focused on some labor economics perspectives on women's participation in scientific and technical employment. Myron Atkin and Robert Worthington took opposing positions on how much leadership the education system can take in correcting the inequalities women experience in the labor market. Speaking about girls' self-images, Helen Astin described some research activities on the formative influences on ways girls make career choices, and Norman Feingold highlighted some specific ways the counseling profession could change to help girls consider nontraditional careers. Summaries of the eight speeches are gives in Section 5.

For the second day, each participant was assigned to a discussion group that met during most of the day. Two groups, moderated by Bernard Kramer, Chairman of the Psychology Department in College II of the University of Massachusetts, Boston, and Mary C. Potter, Associate Professor of Psychology and Urban Studies at MIT, focused on the socialization of women. Another two, moderated by Joan Wofford, President of the Organization for Social and Technical Innovation, and Elizabeth C. Wilson, Consultant in Curriculum, Montgomery County Public Schools, addressed what secondary schools might do to expand women's career choices. The current and potential impact of the employment sector was the subject of the other two workshops moderated by Elaine Bond, Director of Computer Programming at IBM's Armonk offices, and Ruth Shaeffer, Senior Specialist, Organization Development Research, National Industrial Conference Board. The groups were asked to delineate relevant problems and suggest action. Since each moderator was expert in the discussion topic, she (n.b., Kramer) could help maintain the group's focus on the assigned subject.

The luncheon on the second day had as guest speaker Betsy Ancker-Johnson, Assistant Secretary for Science and Technology, U.S. Department of Commerce. The audience all had an emerging awareness that solutions

"What does someone in an ivory tower know about what happens in high schools?"

to current problems such as pollution, transportation, and the energy shortage will require that many more resources be devoted to research and technology. Her discussion of national policy directions in relation to these issues provided participants with a framework in which to see the need the labor force will have for scientists and technologists in the coming years.

"We need groups in all geographic areas to allow for healthy cross-fertilization. People on the eastern seaboard are always forgetting about the rest of the country."

The plenary session on the third day was moderated by Arvonne Fraser, Women's Equity Action League. This was a forum for collective consideration of the recommendations of the small discussion groups.

"If India and Israel can find women leaders, why can't we find women managers?"

The participants' involvement with the proceedings was demonstrated in part by the high response rate (more than fifty percent) to the post-Workshop mailing. Participants were sent the minutes of their discussion group and were requested to ed.. them, comment, and make suggestions for follow-up activities.

3 The Challenge to Change

"Girls look at me like I'm nuts whenever I ask 'Have you thought about being a dentist or about being an engineer?' Yet I hear now that those are the good opportunities."

The premise of the Workshop was that if improvements in the status of women are to be acceptable and durable, they must arise from a clear understanding of the realities of the social and economic environment. Approaches to this understanding demanded considerable effort from the participants to perceive how their own roles and perspectives affected their reactions to those of other participants. A few examples show the kind of tensions participants experienced.

"Too much credence has been given to 'further study' before changing anything. It's just a pigeon-hole for action programs and masks lack of real commitment by people in positions of influence."

Women who were keenly aware of the obstacles in their scientific and technical careers tended to feel extremely impatient about the pace at which educational and employment systems could permit change, even in optimal circumstances. Researchers from academic institutions cautioned against acting without greater knowledge of causes and effects, while others in the groups considered concentrating on research an excuse for inaction.

"As long as jobs can be classified as 'men's jobs' or 'women's jobs,' women will stay at the low end of the totem pole."

Participants from the field of early education and those working with the problems of mature women entering or re-entering the labor force wanted more emphasis on these populations. Some of the teachers and counselors representing large urban schools feared elitism in the attention given the college-bound girl and wanted more focus on vocational opportunities for women high-school graduates. Business leaders were concerned about constructively combining their necessary profit making with corporate social responsibility.

"In our school system, you're judged by how many kids you get into college—so what if most jobs don't require college?"

Despite these tensions and objections, participants indicated that confining the discussion to the assigned topic and a related action agenda was more productive than detailed consideration of every individual's concerns would have been. The feeling was that global approaches were likely to result in global disappointments.

As the second day progressed, participants in the six discussion groups had the common experience of seeing the extent of the bias with which each institution, each discipline, each social group has seen women's issues. Although some of the most obvious inequities in the employment and education of women have been modified, subtle and profound hindrances to women's equal participation in society still exist. Participants agreed that continuous interaction among a variety of people is required to expose and overcome these. For example, legislation is a necessary stimulus but, by itself, it is inadequate to design the range of implementation measures required to enlarge women's options.

Through concentration on the roles of employers and educators, Workshop participants arrived at some recommendations on how these sectors could separately and cooperatively contribute to women's career opportunities. The following three sections, culled from the records of the discussion groups

"If variations in schedule will do such things as cut down turnover or absenteeism, it would pay us to try it."

"I'd hate to see part-time work permitted for women only; it should be for men and women."

"The quickest way to bring about change is to get more women and minorities into responsible positions as fast as we can and let their performance demonstrate that they are effective."

"No matter how good a policy employers come up with, the central personnel office is often only a marginal participant in hiring, and the policy gets distorted by the people in the offices making the actual selection."

and the subsequent plenary session, summarize participants' recommendations for activities that employers and educators could undertake.

The Challenge to Employers

How can the employment sector increase the supply of women in technical and scientific occupations? The employer's contribution to the supply problem was perceived to fall into two areas: 1) attraction and retention of women employees, and 2) communication and interaction with educational and other institutions.

An employer's recruitment and internal policies, as well as public relations, can have considerable impact on attracting and retaining women employees as well as on extending their career opportunities. Affirmative action by senior officials calls for them to develop objectives, to design systems for effecting and monitoring change, and to make employees throughout their organizations aware of these efforts. Some of the Workshop participants' suggestions for specific changes follow.

Recruitment should be broader and more active. Keeping an open mind about the wide variety of ways skills can be acquired would assist employers in finding women qualified for positions traditionally held by men. Women often develop synthesizing, analytic, and other abilities, even though they may not have followed traditional career patterns. Groups of women who are recruitment resources that more employers might consider include:

Women without training beyond the secondary school level but with interest in and aptitude for scientific and technological pursuits. These might be current high-school students, housewives, or employed women who want to move out of the traditional women's jobs.

Women with college training and/or paid or volunteer work experience that could be transferable to technical and scientific occupations. For example, there is a surplus of teachers, and those with training in math or technical subjects might readily transfer into other settings. Some teaching or volunteer work experience might be adequate preparation for a management career track in a scientific or technological organization.

Women with scientific training who wish to re-enter the labor force. Workshop participants felt absence from the paid work force is too readily assumed to have rendered a woman's skills obsolete. They felt more experimentation with job placement and more encouragement could be given women to participate in training programs.

Many employees, once hired, know little about what they can do if they become dissatisfied with either their work or the treatment they are receiving. Orientation programs, often very limited

"Girls and their mothers ought to have an intimate experience—touching, feeling, wiring computers, learning to repair a car. This kind of experience would change women's feeling that technology is a big male monster."

"If men needed day care centers to work, organizations would provide them."

"Women surely have to recognize that they have responsibilities to society as well as rights, just as men do."

in scope and duration, should routinely include information on equal employment legislation, grievance procedures both within the employing organization and outside to governmental agencies, company regulations, benefit programs, advancement plans, etc. Also, thorough orientation to a work place needs to be an on-going process; employers must continuously disseminate information about options and opportunities at every management level.

To bring about the changes that will invite women to nontraditional careers, committees of employers, male and female employee groups, and resource people should be established to discuss and evaluate company programs. These committees could also design strategies for attracting and retaining women employees. Outside these committees, all employees should have occasions to discuss and monitor company-sponsored programs, such as job training, job assessment, and benefits, for conformity with company policy.

Career plans for women, jointly arrived at by management and the woman employee, are also essential. Women employees, including those in such traditionally female roles as secretaries, should be given knowledge of and opportunity for vertical and horizontal mobility within an employing organization. This internal mobility has, by and large, belonged to men only.

Workshop participants felt that the negative image much of the public has of science and technology was another problem that employers could work to correct. Part of this image certainly stems from misunderstanding these fields and the nature of work in them. Many participants agreed, however, that employers in these areas could revise internal policies and practices to improve the attractiveness of scientific and technical occupations for women and men. Having done so, an organization's public relations, both formal and informal, could begin improving the public's image of these occupations.

Other changes Workshop participants thought employers could make need further experimentation and study of their value and cost (especially since there tends to be more reluctance to accept changes that are perceived to benefit female employees rather than male employees). Some of the specific suggestions for study are described below:

The definition of equal work. Equal pay for equal work is essential, but what is equal work? Women often carry responsibilities that are defined as being typical of lower job categories than would be the case if a man had essentially the same responsibilities. Better methods of equating job responsibilities should be devised so that "substantially equal work" does in fact entail substantially equal responsibility.

"Mathematics ought to be part of every subject in the curriculum. It's too important to be left to the math teachers."

Methods of personnel assessment. Determination of how well an employee's demonstrated skills would apply to a new work assignment is complex and difficult. Given the absence of dependable measures, women should be treated with the same flexibility as men, who are often permitted to experiment with new assignments. Similarly, as employers select men for special programs of education to improve their work performance, to change it, or to prevent them from "burning out," they should seek to identify female workers for such programs.

"How can I counsel kids about their futures when I have to spend half my time talking to probation officers?"

Women and labor market fluctuations. Studies are needed to determine the impact of both tight and loose markets on female employment. Women and men will of course fare better in a strong economy, but women should not be unduly subject to labor market fluctuations.

"We can't leave it all to the high school. We have to do more while kids are young."

Financial aid programs. Employers might find training and/or retraining women for technical and scientific occupations would justify the kind of financial aid programs that are often available to men. Employers might also examine the costs and benefits of providing educational opportunities for the female employee who wishes to stay home temporarily with a young child and yet remain a viable employee.

The Challenge to Secondary Schools

In coming to specific suggestions for activities secondary schools could undertake to increase girls' participation in science and technology, Workshop participants explored the broad issues related to the very influential general educational environment. Participants emphasized that the education system's objectives are not and should not be limited to occupational preparation.

In educating students for citizenship, the education system needs to communicate to all young men and women the centrality of science and technology in contemporary life, as well as the ramifications of this fact. Participants stressed repeatedly that educators must also help both boys and girls to see the likelihood that most of them will be combining family and work roles in various ways throughout their lives. Hence, students must be aware of the manpower projections, demographic factors, and other influences on the quality of their adult lives.

Among the important influences will be the increasing attachment of women to the labor force and the likelihood that both men and women will return to school periodically as their interests and vocational needs change. These highly relevant "quality of life" issues need to be incorporated in educational programs in various formats: in courses such as home economics, industrial arts, social studies, and science-oriented courses; in individual and group counseling sessions; and through conversation with adult male and female role models.

"I think that humanities and literature teachers ought to use some of the science literature written by and about scientists and technologists."

No matter what else educators do to increase career choices for female students, they can and must consciously and actively encourage girls to challenge the widespread and ill-founded belief that they cannot or need not learn to work with numbers. In addition to its powerful impact on career choices, educators need to stress the relevance of mathematical skill to daily life even in the home—in investments, tax paying, mortgages, and in getting credit. Mature women now in the work force too often bemoan poor mathematical competence that frustrates them and limits the quality of their performance in preparing budgets, drafting funding proposals, or understanding and negotiating pension plans and other employee benefits.

"We manufacture sophisticated electronics; we can't possibly run day care programs that would be good for kids."

The minutes of the two Workshop groups on education convey the sense that the participants were acutely aware of the "marvelous complexities" of schools and the myriad small steps necessary to change attitudes and behavior. Most of the recommendations for ways to broaden girls' options seem unlikely to require large financial expenditures; instead, they depend on leadership to communicate conviction about the importance of designing ways to raise girls' career expectations and enlarge their opportunities. Schools can join with many other institutions in confronting an already articulated need.

"If a principal like myself is to have a school that helps girls to see their career horizons differently, I need help."

The boards of education, school superintendents, and principals comprise the management of school systems, but those who have most direct contact with girls—teachers, counselors, and other personnel—are in a position to enhance or subvert the stated policies. Parents and peers also are extremely influential. Hence all these groups need to take actions that will ensure that both the institutional and the subtle influences on girls are modified so as to enlarge girls' career options.

Some ideas participants had about actions *school administrators* could take are given below:

Encourage the formation of citizens' committees, composed of parents and occupational groups, that would act as resources and stimuli for change and would ensure that the available educational resources are fully utilized by girls.

Hold principals and staff accountable to school superintendents for providing equal opportunity for girls, for eliminating barriers, and for developing specific measures that enlarge girls' choices in athletics, shop, home economics, math, science, etc.

Undertake system-wide collective thinking about the curriculum, possibly direct intervention in the selection of courses and major concentrations at every age and grade level. The importance of girls beginning to understand at an early age how the study of science, mathematics, and technical courses can affect their future life choices has to be recognized. Primary and secondary schools have an enormous impact on the competence and confidence with which girls pursue these subjects.

"We need coed counseling all through the school years so that boys and girls can share aims and aspirations and learn new roles, new modes of accommodation to each other."

Experiment with methods that would attract girls to mathematics, science, shop, and technical courses.

Assume a major role in developing coherent approaches among elementary and senior high personnel that guarantee girls at all grade levels a hospitable environment in which to persevere with mathematics, science, and technical subjects.

"Science and technology may not be basically unattractive to girls, but the attitudes of male science teachers certainly make a difference."

Actively recruit girls for vocational programs that have traditionally enrolled only males. Nondiscriminatory regulations are necessary but not sufficient.

Develop incentives for teachers, counselors, and administrators to acquire better understanding of the world of work.

"Teachers colleges and in-service training programs for teachers and counselors have to change since there just isn't going to be much turnover to provide new ideas."

Establish inter-institutional communications mechanisms so that schools could utilize the personnel, environments, resources, and programs of colleges, post-secondary vocational schools, and local employers to expose teachers and counselors to technology and scientific fields.

Avoid sex stereotyping in hiring practices whenever possible. Nurses, bus drivers, office personnel, cafeteria workers—the entire group of men and women who comprise the school staff—are role models for the students.

Take account of the significance of school physical education programs in forming male and female attitudes about sex roles and relationships. To equalize programs for boys and girls, it is important to revise budgets and utilization of school personnel.

Integrate existing courses in shop and home economics, or develop new curricula so that both male and female students are exposed to family management courses that encompass child rearing, nutrition, consumerism, finance, administration, and maintenance of home and equipment. Such an approach should take account of the technical and scientific dimensions of these issues as well as emphasize the dignity and appropriateness of work in the home and in the marketplace. Both boys and girls should develop competence to change tires and change diapers.

The groups that interact on a daily basis with girls—teachers, counselors, parents, and peers—have a very significant influence, perhaps a more subtle one than do school administrators, on girls' attitudes toward themselves and their careers. The issues on which Workshop participants focused include:

The importance of teachers' recognizing that they have a significant influence through their transmission of curriculum, their attitudes about male and female roles, and their own examples as role models. Especially teachers in social studies, English, the humanities, and languages—subjects girls have tended to pursue most often—need to understand the ramifications of science and technology as well as the changing roles of women in society. Teachers in mathematics and science—courses that frequently have the reputation of

"Perhaps every teacher should be obligated to devote one session a week to her subject's relationship to the world of work. But teachers don't have much exposure to the outside world."

being difficult and narrow—should actively encourage girls to take these courses and assure the girls that they are capable of coping with all such subjects.

The relationship of a teacher's subject to employment. All teachers need to know this relationship; to learn it they can plan field trips and/or invite men and women in technical fields to meet with students.

"Counselors are more likely to attend conferences about psychology than about the labor market. So they often don't realize that the jobs of the future for girls might be electronic technicians, engineers, dentists, and accountants."

Guidance personnel's need for continuous and extensive experience with the world of work, and a good understanding of manpower projections. This is essential if counselors are to help girls to weigh their interests and abilities in relation to "real world" possibilities.

The workload of counselors. Often so overburdened with crisis situations or disproportionately involved with college applications, counselors fail to provide the early counsel and support for all girls who might be candidates for technical or scientific careers.

"Girls seem much less likely than boys to see what the devil is the connection between science and math in school and their real lives."

Counselors' potential to have a positive influence on breaking down sex stereotyping of certain jobs. By encouraging female interest in areas other than stenography and clerical work, and by encouraging boys to pursue these occupations, counselors would encourage the removal of barriers.

"Employers may recognize they haven't done all they could and that they need to be reminded of what to do and how to do it."

Ignorance by girls and their parents about available financial aid programs. Counselors can inform them of these opportunities, and do whatever possible to ensure that girls are equally considered by grantors.

Parents' impact on career choices and the future economic welfare of their daughters, in particular, and their sons. Life experience, including occupational frustrations of some mothers and fathers, will have sensitized children to such issues. It's all too rare that parents speculate about careers with their daughters as they do with sons. Schools could help parents become aware that their daughters are taking important steps toward careers while in school.

Career education programs and parental involvement. The PTA might sponsor programs that educate parents about careers for girls. In addition to including parents as parts of career education programs, schools can use parents working in technical and scientific fields as consultants and resource people.

Peer groups are a major socializing influence, particularly in the adolescent years. High-school students themselves are the parents of the next generation, and they have, in recent years, demonstrated a powerful capacity for personal change as well as for influencing others. Because male attitudes strongly affect female decisions, boys as well as girls must understand the importance of eliminating sex barriers to free choice of education and employment. These life style issues can be presented and discussed in various formats—social studies courses, home economics, "rap sessions," in individual and group counseling by professionals and peers, by participation in conferences, and in meetings with men and women in technical and scientific fields.

"I teach science to tenth graders and this is the first time I ever met anyone from industry—the only jobs I knew about for girls were lab technicians and nurses."

"We want to work with high schools because that's one way we can compete for our potential labor force."

"A good many managers are very forward thinking, but whatever industry does ultimately has to be translated to dollars and cents, or the industry won't be there to supply any jobs."

"Our profit margin just isn't high enough to afford a continuous work program for more than a few school teachers and students. Short-term and temporary employees generally cost more than they produce."

Employer/Educator Cooperative Efforts

Employers and primary and secondary schools need to cooperate in developing ideas and programs that will affect the future labor supply. It makes good business sense for employers to work with the schools to increase the supply of qualified scientific and technologically oriented personnel, with special emphasis on women. Such activities by employers also can be viewed within the broad framework of corporate social responsibility and good public relations. Some models of cooperative efforts are available and mentioned below; others could, of course, be developed.

At the local, community level, the education and employment sectors could create a variety of exchange programs to provide channels for direct contact among their members. Teachers and counselors, who rarely have direct exposure to work in scientific and technological organizations, could be invited by these organizations for internships, summer employment, seminars, and open houses. Similar programs should involve students. The enhanced understanding of work in these areas that would ensue from such programs could have considerable impact on the education and counseling of girls and expanding work opportunities. Such exposure should, for example, alert school personnel and students to the necessity for mathematical competence in almost every work role so they do not continue to take it lightly if girls do not develop such competence.

Even at the primary level and certainly at the secondary level, skilled workers, technologists, and scientists could be loaned to schools to serve as experts in a particular subject and to aid in career guidance. These experts should be men and women; many studies have shown that women who pursue nontraditional careers have benefitted from a man's encouragement, usually a father or a male teacher. However, girls, boys, and parents as well, need contact with women acting in nontraditional roles. To extend parental involvement, schools could include parents with their children in programs where workers act as consultants. Informal occasions such as open houses for parents, students, teachers, and workers would usefully complement career guidance activities. Employer policies that permit released time for participation in school programs would help make possible this kind of interaction.

Part-time and summer employment in scientific and technological fields would provide girls with excellent opportunities and motivation to undertake a career. Such work experience would not only provide the employed students with examples of the practical applicability of their scientific and technical knowledge, but would also communicate to other students the acceptance of girls and women in these occupations.

Financial support for these undertakings should not be the sole responsibility of either the schools or the employers. To emphasize the joint commitment of

"I wish I could get some training in how to teach compensatory mathematics to ninth-grade girls so they wouldn't go through life thinking they can't understand taxes, pension plans, the stock market. . . ."

"A survey by one feminist group of 134 elementary school readers in use across the nation found that boys outnumber girls as main characters, 5 to 2; men were portrayed in 147 different jobs, women in only 26, and frequently as unintelligent, nonadventurous, one-dimensional human beings who rarely made decisions and almost never worked outside the home."

both sectors, funds should be sought from both, as well, perhaps, as from government and foundations.

While the above efforts could easily be mounted at the community level, given strong leadership conviction and negligible new mechanisms, much needs to be done at the state and national levels, and the formation of new groups will be necessary. Industry and occupational organizations, individual employers, and educational policy makers and school systems at all levels need to maintain on-going interaction. To achieve this, inter-institutional committees can be established, composed of varying combinations of employer and educational organizations, occupational and professional organizations, women's caucuses and unions, media representatives, civic planning groups, etc.

As one participant put it, "If you are going to reach employers, teachers, parents, and students now and in the future, you must have a visible place to identify with—centers that could be regional, state, or national, and that would facilitate cross-fertilization of ideas and cooperative planning." Workshop participants saw possibilities for a *central agency* that would serve as a catalyst for some of the following activities:

Convening conferences, workshops, seminars, and other programs that would provide opportunities for employers, educators, and other groups to consider together such issues as recruitment, selection, guidance, and retraining women for careers in science and technology. Continuous liaison among these groups should also be encouraged.

Facilitating interaction among diverse operating and research groups. For example, the most effective ways to deliver guidance and educational services to women throughout their lives need to be explored, as do systems for establishing institutional accountability for progress of women within organizations.

Giving technical assistance to schools and employers in designing programs that will increase the supply of women in scientific and technological occupations.

Working with state and federal agencies and private foundations to fund case studies of model programs.

Stimulating and monitoring the media—textbooks, career materials, magazines, newspapers, television, radio, films—so that they present science and technology and women's relationship to these fields accurately and encouragingly.

An effective central agency of this type would require a regular staff, and perhaps a new professional role: that of an education/work liaison consultant. This person would function as an "honest broker" between the employment and education sectors and would continuously monitor and work with them to adapt creative ideas to enlarge women's opportunities to their institutional settings and to develop and evaluate implementation procedures.

4 Can We Get There from Here?

Yes, but there are no magical prescriptions. The Workshop's suggestions can be summarized in large part by saying that institutional change calls for leadership commitment to it, better communication within institutions, between institutions, and greater sensitivity to the subtle ways in which females are guided by their parents, teachers, peers, and employers. The solutions are simply stated, and even when few new institutional mechanisms are required, they are nonetheless difficult to realize.

"A male chauvinist like myself has always been partial to females, but slowly, my wife and daughter are making me a convert to feminism."

Everyone agreed that responsibility for change must be shared, and that action itself is a powerful teacher of new attitudes. But since individuals and institutions procrastinate, despite sincere intentions to promote equal opportunity, schemes and structures must be devised that hold people accountable for implementing and monitoring activities that will facilitate the removal of traditional sex role expectations. The task of changing institutions to deal with equal opportunities for women will often be relegated to women only. This is unfortunate on many counts, not the least of which is that leadership in education and employment is still largely male. Section 3 of this report suggests ways educators and employers can orchestrate the responsibility.

"Good wishes, good intentions, and good goals aren't enough. You have to force managers, who have the greatest control over the future of employees, to record promotions, wages, etc. of individual employees."

Some questions will come to mind as people read this report. Couldn't much of it be equally applicable to issues involved in the education and employment of males? Obviously, boys too could benefit from better understanding of the world of work, better counseling, etc. However, for the time being, institutional change will be unlikely to benefit girls and women in substantial ways unless it is consciously and deliberately directed at them. Given specific emphasis on including females, it would be quite feasible to incorporate these suggested institutional changes into on-going teacher centers, in-service training programs, and management committees without excluding males.

Does the emphasis on expanding occupational options for women mean that work in the marketplace is valued more than work in the home? Implicitly, the participants agreed that individuals should be free to choose the allocation of time between home and work throughout their lives. Institutional behavior should not "load the dice" so that women's freedom of choice is in fact restricted. Everything possible should be done so that the destructive effects of the dichotomy between work in and out of the home are minimized for both men and women.

A number of participants feared that action might be taken before sufficient knowledge and understanding are achieved. In general, people favored learning not only from academic research but also from empirical experience with different approaches. Attempts certainly should be made to audit and monitor efforts and to utilize research results in planning. However, the actions needed to enlarge women's participation in society are dynamic,

"Unless we get subsidies or substantial tax incentives, day care and retraining programs just can't get high priority. Perhaps they could be included in a benefits menu all employees would get. Benefits would have equal dollar value but would be different in kind."

"Women don't enroll in the kind of curriculum that would prepare them for managerial positions in high technology."

"We should remember the whole range of jobs, not just the upper crust of science and technology."

should be observed over a period of time, and may not be subject to quantification.

Are we urging the creation of more massive unemployment by flooding the labor market with a heretofore unemployed segment of the population? No. Forty two percent of women are already in the labor force, and are tending to remain for more years (the average woman worker will spend twenty-five years in the labor market). Our argument is that they are entitled to a more equitable share of the benefits and opportunities paid work today confers mostly on men. Obviously, the ideal economic situation would provide as much paid employment for all men and women as they want. Already a large part of the labor force, women are in need of earned income and status just as are men. More constructive bases for allocating available market and non-market work have to be devised then those based on sex or race.

The many points of view expressed by Workshop participants showed vividly that change efforts must include recognition and respect for the reality that neither the education nor the employment sector is monolithic. Therefore, the proposals coming from the Workshop can serve to provoke other individuals and organizations within these sectors to make adaptations consistent with their own needs, priorities, and possibilities. Those who share interest and concern about the full development of the human resources that women represent are urged to enrich these suggestions with their own modifications.

The magnitude of the problem of expanding options for women is great; its dimensions are so pervasive that no less than simultaneous, varied, and continuous efforts on many fronts by many individuals will suffice.

5 How the Experts See It

Employment—
Frank J. Toner
and John Kingsbury

A major purpose of the Workshop was to help the participants understand the realities and constraints of the employment world. Frank J. Toner, Manager, Employees Relations Management and Practices, General Electric Company, New York City, spoke from the management point of view about the problem of training and employing more women in science and technology.

"I am taking the time to tell you about our experience not because any one company merits that much attention, but because I think it may be useful for you to see the perspective of an industry-management team that is under the rigorous disciplines of a competitive marketplace, but is also charged by society with correcting a long-standing inequity and must try to do so within a business setting."

By way of background, Toner described GE as employing 360,000 people in more than 200 plants and 100 laboratories around the world. GE is one of the world's most diversified companies, making over 200,000 different products, and all of the goods and services "spring from technology."

GE employs many women trained in science and technology. While some positions, especially those in research, development, production, and management, require college degrees, there have been and will continue to be opportunities for women who are not college graduates but who are trained in some technical area. "For example, women will be needed to service and sell our appliances. There will be demands for electronic, chemical, and mechanical technicians; draftsmen, detailers, and designers; machinists and machine operators; mathematicians and medical technologists; tool and die makers—the list goes on and on. Today some of these kinds of positions are filled by graduates of our apprentice programs that include women, and other women who have been trained within the company to work at these technical tasks."

"We are interested in results that not only meet the government's explicit requirements, but also open up opportunities for us to utilize the talents of women and minorities more fully and at progressively higher levels of responsibility. Further, we recognize that the results won't flow automatically, and that managers need exposure to new procedures and decisions in an area which many of them find difficult and unfamiliar.

"Moreover, as businessmen, we must be constantly aware of women's consumer clout. After all, women are the principal regular buyers in most families. . . . This gives us added incentive to exert a leadership role in the area of employment opportunities for women. . . . In fact, it is a major thrust for 1973."

In discussing women's small participation in scientific and technological

positions, one factor that ought to be considered is the *supply side* of the equation. "We at GE are undertaking an effort that involves a longer time-range frame. This is to build the supply base back at the high school and the college level. We believe the real problem is not so much one of demand, but rather of supply. So let's examine the problem."

"It takes a special education and special training to qualify for many positions in our highly complex and technically oriented industrial society. No matter how hard a woman may be willing to work, no matter what her native talents may be, she cannot do competent engineering work without a knowledge of engineering. Nor can she analyze a chemical formula without the necessary education and training in chemistry. We must avoid the problem of raising expectations without proper preparation, as this only leads to frustration.

"Until industry can get large numbers of qualified women trained in engineering and hard sciences, women cannot become a significant element in top professional and managerial ranks. Thus, we welcome the opportunity to work with schools and colleges on beginning to correct that situation, long range.

"It will take a multi-sectored effort. The business and industrial community, the educational establishment, including the primary and secondary schools, and the government all have to be enlisted in this effort. . . .

"GE and all of industry have a responsibility to include women in . . . training programs, and the educational institutions have a parallel responsibility either to train women for these kinds of jobs and/or to provide the counseling and guidance that would motivate young women to seek out these opportunities." That is the first challenge: building the supply base.

The second challenge has to do with image. In many foreign countries, the idea of women in engineering and other technological fields does not seem to be unusual. "In Russia, for example, about a third of the engineers are female. (And seventy-five percent of the doctors and twenty-eight percent of all construction workers are women.) . . .There has been a lack of true information about the scope of careers in science and technology. . . . The majority of scientific and technical jobs are perfectly suitable for women, although admittedly a few *men* may not readily agree with that. But technology presents no more problems to a woman than any other male-dominated profession such as law, business, or medicine. . . . And finally, there has been a genuine lack of realization that these choices are available to women, and that it is a field of wide-open opportunity for them. Probably the only limitations are ability and willingness to accept the challenge."

The American Telephone and Telegraph Company (AT&T) is the largest service industry in the United States; its policies and activities have significant

ramifications both within and outside of its structure. John Kingsbury, Assistant Vice President for the Human Resources Department, New York City, presented a summary of a comprehensive plan, generated in part by government action on equal rights in employment, for revising the employment practices of AT&T. The company's response to the problem of the distribution of women in employment offers a valuable and provocative example to educators preparing girls for employment and to employers confronted with the need to implement equal employment practices.

Kingsbury restricted his remarks to "how the Bell System is struggling with the problem of finding more women for technical jobs on the professional level, and increasing the flow of women into skilled craft jobs, such as central office maintenance personnel, installers, repair workers, and other outside craft workers." The Bell System companies represent a broad geographic, occupational, and organizational range. The operating telephone companies comprising the Bell System include 20 companies across the continental U.S., employing almost 800,000 people. These companies employ slightly more women—53%—than men, and occupations in the company have portrayed the same classic sexual profile that is characteristic of most parts of industry and government. There are occupations virtually dominated by women and others comprised of practically all men. "We have been wrestling for some time with precisely the same problem that is the subject of the Workshop: how to increase the participation of women in scientific and technical jobs. . . . (and) a corollary of the problem . . . how to increase the participation of men in jobs formerly seen by them as 'female' jobs."

"The Bell System is relying on certain historical data and theories in formulating a course of action. In this process we were fortunate in having the advice of two women: one was Dr. Leona Tyler, Dean Emeritus of the Graduate School at the University of Oregon, and President of the American Psychological Association; the other woman was Dr. Valerie Kincade Oppenheimer, Research Sociologist at UCLA, and a pioneering researcher in the field of the female labor force in the United States.

"For the past seventy years, women have not been randomly distributed throughout the occupational system in the United States. . . . For example, in clerical occupations, women comprise seventy-four percent of all workers, and almost twenty percent of all women employed are clerks.

"Analysis of occupational data shows that women tend to be clerks, telephone operators, retail sales workers, waitresses, household domestics, and assemblers in manufacturing plants. On a professional level, they tend to be nurses, teachers, home economists, and dieticians. Further analysis of data shows that the predominance of women in certain occupations is found in education, government, and industry alike. . . .

"The entire fabric of society tends to reinforce the tradition of sex roles, including television and motion pictures, guidance and career counseling, advertising, textbook pictures—and even pictures in the *Occupational Outlook Handbook* of the Department of Labor."

In addition to the factors cited above, AT&T has relied on two other fundamentals, aided "in all candor, in making our decisions, by what the courts have said in various cases." One is "the principle of individual differences," which means that "while there are differences in general between men and women, there is an overlap of preferences, abilities, and aptitudes on which to build. . . . we are working hard at looking at each person as a unique individual. . . ."

"The other factor on which we are relying is that society is undergoing a process of change. There is a broad shift in public attitudes on job choices. . . . speed of change is uncertain, and the degree to which youth is responding is slow. . . . And, though I do not see it as primarily our responsibility, we are committed to participate in and aid this process of change in as many ethical ways as we can."

During the past few years, Bell Telephone companies have taken significant steps to increase the proportion of women in technical work, both on a blue-collar and managerial level. On the management or professional level they took these actions:

Increased recruitment of female engineering graduates; not an easy task in view of the well-known shortage of women entering the engineering and scientific disciplines.

Job analyses of the entry-level engineering jobs, which showed that some jobs could be filled by women and others with technical degrees in non-engineering, allied fields.

Development of an engineering early assessment program to identify employees, including women and minorities, who have the qualities for success in entry-engineering jobs.

On the nonmanagement level, they followed a planned course of action aimed at increasing the number of women who take technical jobs, which included:

Close scrutiny of recruitment materials for signals of sex preference: pictures, pronouns, drawings, and ads now include both males and females.

Establishment of selection techniques to eliminate those adverse to women, such as height standards, child care standards, and questions about marital status and number of dependent children.

Development of sophisticated sex targets for each occupation for 1973, '74, and '75 that tell managers and interviewers exactly how many women occupy inside craft jobs, installer jobs, and others at the end of each year, and what percent of anticipated hires should be women.

Revision of upgrade and transfer procedures; anticipated openings for the subsequent twelve months are publicized to employees, and they can request transfers to any job they wish, and for which they are qualified.

Very effective industry-wide procedures were adopted by AT&T to further ensure an increase of women, and men, in nontraditional jobs:

Distribution to each applicant of a brochure describing the major categories of the jobs the companies have, and the starting salaries for these jobs.

Two full days training for interviewers on Civil Rights laws, regulations, and the companies' affirmative action program, including "awareness" training designed to enhance interviewers' appreciation and enthusiasm for affirmatively recruiting men and women in nontraditional jobs.

Modification of institutional advertising to depict men and women in all jobs whenever employees are shown.

Production of a film for use in theaters, schools, and the general public entitled, "All Kinds of Jobs," which makes liberal use of men and women performing nontraditional jobs.

Kingsbury was realistic in his assessment of results so far and anxious to share

some plans for future application with the participants. "Of course we recognize much more needs to be done. We have found that we have stimulated a large flow of existing women employees from traditionally female jobs into the better-paying craft jobs in our dialing switching centers. The flow from inside and outside the business into outside craft jobs—installers, line workers, and splicers—has been small."

"We have also found that more men than we thought at one time are inclined to take nontraditional jobs, such as operator and clerical positions. Last year seven percent of our operator and thirteen percent of our clerical hires were male.

"Despite our efforts so far, the Bell companies face the same impasse all of you are facing. When men and women seeking jobs with our companies contemplate the opportunities available to them, many of them still reject certain jobs as undesirable.

"We have many plans that are designed to work on attitudinal factors that operate to inhibit youth from seeking nontraditional jobs. We are working on a series of employment films portraying men and women actively performing our entry-level jobs. . . . We are developing an affirmative action brochure for use in schools that will show men and women performing non-traditional jobs. . . . We are planning model ads for use in high-school newspapers and in daily papers, and a lecture demonstration for use in our speakers' bureaus around the country, all of which stress the theme of nontraditional jobs and motivating men and women to strike out for that which they have not considered in the past."

Summer sessions for high-school guidance counselors, and summer employment for students will focus on jobs not normally considered by young men and women.

"And while it is perhaps not my role to comment on this, the fact is that there is so much to be done with educators and business people such as yourselves, on radio and television, with associations and social groups, in fact with every segment of society. Meetings such as these are high on our project list. Why not a similar workshop on a local basis in every major city in the country?"

Labor Force—
Phyllis Wallace and
Betty Vetter

Phyllis Wallace, Visiting Professor, Sloan School of Management, MIT, was asked to focus on the relationship between the general economic situation and the possibilities for women in the labor force. She began by saying that "several of the questions posed are those generating considerable debate and discussion among economists." She suggested several areas that warrant further investigation in order to develop the kind of knowledge base that will advance the policy planning.

She stated that "there is no simple formula for full employment, . . . (and)

the shape of the alternative futures may heavily depend on which assumptions, definitions, and methodologies are used." She went on to quote from the *1973 Economic Report of the President* (page 89): "Concern is sometimes expressed that the increase in women in the labor force will reduce the employment opportunities for men and raise their unemployment. There is no reason to think that would happen and there is no sign that it has happened. The work to be done is not a fixed total." On the other hand, she pointed out the warnings in the Carnegie Commission Report on Higher Education entitled *College Graduates and Jobs: Adjusting to a New Labor Market Situation* (April 1973), to the effect that an increasing number of college-educated persons are not going to find employment that coincides with their academic qualifications. These differing perspectives point to the need for "one organization, preferably in the private sector, to undertake this critical long-range analysis of economic potential, manpower requirements, and implications of expanding employment opportunities for women. Sophisticated models could be developed. . . ."

She suggested further that there be future workshops to deal with the serious economic and social consequences of reduced population growth during the last third of this century.

In relation to employment directly, a controversial issue will be how to implement affirmative actions without conflict and disharmony in the work place. Longitudinal studies of developments within AT&T, for example, might clarify some of the developing issues in implementation and their effects on the existing work force. Cost and benefit studies for both employers and employees need to be done on such accommodations as part time or flexible schedules. The effects on the family as a decision-making unit have not been subject to economic analysis, though this research might be fruitful to understanding influences on the economic behavior of men as well as women in the coming years.

She emphatically urged accelerating cooperative efforts and expanding measures within government at all levels to advance possibilities for the diversification of women's labor force roles.

Betty Vetter, Executive Director of the Scientific Manpower Commission, Washington, D.C. (affiliated with the American Association for the Advancement of Science), spoke specifically about the employment opportunities for women in the sciences and technology. She stressed that a major problem for both sexes is that of "obtaining accurate and realistic information on a continuing basis from the time they are required to make the first decisions that may close doors to a future career in these fields, to the time of graduation, and even later. As early as seventh grade, selection of the wrong mathematics courses may close opportunities. . . ."

"Young women need to be provided with one additional piece of information—namely that fields of science and engineering traditionally dominated by men are not only open to women today but are increasingly inviting in terms of job opportunities and beginning salary level."

Vetter insisted that "we are unlikely to train more scientists and engineers than we need, or even more than we can use. . . . provided we encourage only those students who possess the triple requirement of an aptitude for science and engineering, an interest to pursue it, and the ability to master the technology already created. . . ."

"While we can readily perceive the needs for people with technological backgrounds to solve such nationally recognized problems as cleaning up the environment, producing adequate amounts of energy, solving transportation problems, etc., we have great difficulty in projecting beyond one political administration what priorities will be given to these problems, and thus what level of financial support may be put into their solution."

It is easier to predict the supply of men and women trained for careers in science and technology than to predict the demands for them.

"The longitudinal research program of the American Council on Education,

which asks freshman students about their prospective majors, shows that from the fall of 1966 to the fall of 1972, the proportion indicating an interest in the physical sciences and engineering fell from 13.1% to 8.8%. Among women students, where we might have expected some increased interest, the proportion of the freshman class in 1966 whose probable major was in physical sciences or engineering was 1.5%. By 1972, only 1.2% indicated such an interest. There was a slight rise from 3.2% to 3.8% who expressed interest in the life sciences, while interest in mathematics fell from 4.5% to 2.2% of the freshman women."

On the demand side, "Short-range demand projections, made on an annual basis by Frank Endicott of Northwestern University and by the College Placement Council, show that while employment opportunities for all new graduates dipped sharply in 1970 and 1971 as the economy dropped across the nation, the 1972 graduates found a slight upturn in opportunities, and beginning offers to the graduates of 1973 are up sharply, particularly in the science and engineering fields."

The Department of Labor projects a demand for 45,000 new engineers per year from now until 1980, although we do not expect to have more than 32,000 at the maximum by 1977. Mathematicians, chemists, and physicists are also expected to be in short supply, although the Department projects a substantial over-supply of life scientists.

In answer to a question, Vetter said: "Unfortunately, I don't know anybody who knows what the employment situation will be seventeen or twenty-one years from now, but nevertheless the eighteen-year-old young men and women starting college have to make decisions based on the best information there is. We have to give them this information, but most important they have to decide on the basis of what interests them, and what they think they can do well. Job security is not guaranteed in any profession that I know of. . . ."

"Every time I speak to a group of counselors I discover that not only are they misinformed about careers, particularly in engineering because engineering isn't taught in high school, but they are misinformed about the demand. They are still telling seniors in high school that we have tremendous unemployment problems in engineering. That information is not just incomplete, it is completely erroneous. The April 1973 issue of *Science Education News*, published by the American Association for the Advancement of Science, is totally on opportunities for natural scientists and engineers in the '70's. This is a quarterly for high-school science teachers and counselors. It could give counselors the picture they don't have."

For the women who choose to interrupt temporarily a scientific career while their children are young, the following options are possible: "A woman who is sufficiently motivated and determined

may be able to keep up fairly well with new developments by reading the journals, attending some professional meetings, and maintaining professional contacts. While her skills may get rusty, they will return quickly when again put to use. . . . Another choice is to work part time during the children's pre-school years, and hopefully this option will become increasingly available. The woman scientist or engineer also can leave the field, planning to return to school for refresher and update work when she is ready to re-enter the working world; or she may plan to move into tangential areas such as management, scientific writing or editing where her specific technical knowledge may be much less needed than her general technical background."

College majors in engineering or natural sciences should be aware that "these fields are excellent springboards to majors in other fields including the social sciences, business administration, and even the humanities. . . . but science and engineering are extremely difficult to enter at any advanced stage if the previous preparation has been in other areas."

Education—
J. Myron Atkin and
Robert Worthington

J. Myron Atkin, Dean of the College of Education, University of Illinois, was asked to talk about the potential of the educational system for assuming major responsibility in career guidance and education to accelerate the participation of women in science and technology. He stated that the organizers of the conference "seem to have assumed that the schools have considerable potential as a force in attracting and preparing a substantially larger number of women for careers in the professions. My aim . . . is to comment on the schools as an instrument for social change and to reflect a bit on the process of educational change itself. But to anticipate my conclusions a bit, the advice you'll hear from me today is that you be realistic in your expectations, that you tailor your strategies to the possibilities, and, in fact, that you think small. . . ."

"Let me remind you of the disappointments we've suffered during the past twenty years as we've tried to utilize the school as a major instrument of social policy. . . . To improve our defense posture, it was decided that the federal government assume an aggressive role in improving instruction in science and mathematics. We passed a landmark piece of federal legislation—landmark in the sense of the intrusiveness of the federal government in school affairs—in 1958 with the National Defense Education Act.

"The spotlight shifted a few years later to ameliorate race relations, then to encompass all those living in poverty. On through the decade we heard about environmental problems, the problems of the Indians, about sexism in the classroom, and joylessness, and the schools were going to help us solve them all. . . .

"School people, I believe, tried to be responsive during each of these shifts in public concerns. Out of a sense of their own importance and out of a sense of the key role of the school, plus perhaps a sense of guilt, the teachers who prepare curriculum materials tried to meet whatever it seemed the media were proclaiming as a prime social problem at the moment.

"However, as we enter the 1970's, we hear that the educational policy initiatives of the 60's were failures. . . . Another view of the 60's is that there was some significant modification in the schools, and for the better . . . we have created an atmosphere in which however responsive teachers might have tried to be in the past, they are in less of a mood to be responsive now. In many professions, we are dealing with demoralized groups who are periodically told that they are failing in their responsibilities to the American people, and that they ought to try something new. . . .

"In the case of the educational system, we may be discussing a particularly inert enterprise. Consider the fact that we have well over two million teachers in American schools. They work in more than seventeen thousand separate governing units. There are not the kinds of incentives for teachers to change practice that we heard about so forcefully this morning when discussing industrial programs. If we aren't to capitalize on a professional sense of responsibility, . . . then I submit that the possibilities for change in the educational system are modest. I believe this is compounded by the fact that we are not going to be introducing large numbers of new entrants into the profession. It is a well-known fact . . . that we are dealing with a very stable group now who staff American elementary and secondary schools. . . . I caution you against using the metaphor . . . of somehow

trying to 'engineer' something different in the schools. . . .

"I suggest that a metaphor might be more useful in thinking about change in so large a system is one drawn from evolution. This metaphor might suggest that we look at natural variations within the system that seem adaptive and progressive. One of the benefits of the evolution metaphor, though it is a much more conservative one than engineering, at least in terms of the rhetoric it espouses, is that when modifications arise within the system it can be assumed that many relevant factors have somehow been accommodated: community pressures, teachers' traditions, and the third-grade teacher down the hall who tries to keep all innovation out of the school although she has no administrative responsibility in the building."

Atkin concluded by delineating what he considers to be the most powerful influences at schools: "First, schools are agencies in which we bring together children who are approximately the same age, but not always by age groups. Second, school is the first institution outside the family that youngsters are exposed to, and they make many inferences about the society and the kinds of institutions established by the society as they observe how things happen in schools, what the rules and regulations are, and how the hierarchy works. A third powerful influence are the adults who staff the schools—all of them.

"We know a great deal about the kinds of individuals who choose to enter teaching. I urge you to plan your strategies for addressing the problem of increasing the number of women in science and technologies in the light of that knowledge. . . . The curriculum does have . . . some powerful effects. However, they are overwhelmed by other factors. I urge you to consider well if this point has validity as you ponder strategies. . . .

Robert Worthington, then Associate U.S. Commissioner of Education for Adult, Vocational, and Technical Education (currently Visiting Professor of Education, Graduate School of Education, Rutgers University, New Brunswick, New Jersey), discussed the concept of career education and why the Office of Education has established career education as a "catalyst to change educational practices at all levels in our nation's school systems."

"Career education is a revolutionary approach to American education based on the idea that all educational experiences, curriculum, instruction, and counseling should be geared to preparing each individual for a life of economic independence, personal fulfillment, an appreciation for the dignity of work, and good citizenship as well."

The fundamental distinction between career education and vocational education is that "vocational education is targeted at producing specific job skills at the high-school level and up to, but not including the baccalaureate degree; career education embraces all occupations and professions and can include individuals of all ages whether in or out of school."

There is a need for the concept of career education to evolve and be installed

in American education at all levels for a number of reasons, for example:

The increasing separation between students and the world of work. "Students feel they are not needed by a technological society since fewer and fewer workers are necessary to produce more and more consumer goods."

The high-school curriculum many young people choose. "About one-third of all American students pass through high school by way of what we call the 'general curriculum,' a type of education which leaves its graduates neither trained with a marketable skill nor qualified to pursue further education."

The widespread undesirable, counter-productive, separation of vocational education, general education, and academic curricula in many of our schools. ". . . those in the vocational curricula are often viewed as low-status individuals, while those in the academic curriculum emerge with little contact, preparation toward, or qualification for, the world of work."

"Our present system often results in hasty career decision making and fails to offer individuals the option of changing directions during their years of preparation or of obtaining new training and shifting occupations later on in life. . . . our current system neither provides students with adequate career guidance and counseling while in school nor adequate opportunities for counseling, retraining, and re-entry once they have left the system. Our economy, which is based on technological change, where the rate of change itself is ever-increasing, thus freezes out a large number of adults who do not have an adequate level of training and education.

"Career education, as we now envision it, has five levels which are not distinct and often are overlapping. . . . it involves . . . all children and youth and adults. Each level has appropriate academic as well as vocational education . . . and career guidance and counseling.

"Beginning with the earliest school experiences, career education provides at the pre-school and elementary levels a program of career awareness and occupational orientation for all children. At the middle school and junior high-school levels, all students participate in occupational exploration in developing an understanding of the world of work. The secondary level emphasizes the development of salable skills, further in-depth occupational exploration, and work experiences for all students. The post-secondary, adult, and continuing levels of career education required continued career information and guidance, as well as sophisticated occupational preparation."

Worthington said that the emphasis on college degrees as "the ticket into high-status positions" is most unfortunate. Not only are "the numbers who do not complete college . . . increasingly out of proportion with those who do go to college," but also the "Bureau of Labor Statistics points out that in the forseeable future, nearly eighty percent of the jobs to be filled will not require a college degree. . . . there has been a misguided assumption that you need a college education in order to get a job."

The Office of Education is developing programs that expose girls and boys to technology and work and that contribute to new role definitions for women.

"In an attempt to counteract sex-role stereotyping at the pre-school and early elementary levels, we have recently completed an experimental series of films to be shown on the CBS television show 'Captain Kangaroo.' We have attempted in these shows to show little girls a more realistic picture of the kinds of work that people do to earn a living. . . .

"One of the most successful attempts to involve all children in an understanding of technology and the man-made environment is the New Jersey Technology for Children program, which began in 1965 with the support of the Ford Foundation. This program is now in operation in more than one thousand elementary schools. . . .

"The federal government has recently taken some very positive actions affecting women. In February 1971, the then Secretary of Health, Education, and Welfare, Elliot Richardson, created the Women's Action Program," which initially combined two distinct areas of concern: discrimination against women within the Department, which is one of the largest departments of government, and problems of sex discrimination in society in general. The Women's Action Program has been an advocacy office, applying its knowledge to practices in HEW and health, education, and welfare programs across the nation.

In 1968, the Civil Service Commission established the Federal Women's Program as an aspect of the Equal Employment Opportunity Program, and required that each Executive Agency establish a counterpart program.

In 1970, the President's Task Force on Women's Rights and Responsibilities called for the establishment of a women's unit in the Office of Education to give leadership to public and private efforts to eliminate discrimination against women in education. A report by the chairman, Virginia R. Allan, "A Matter of Simple Justice," is available.

In January 1972, Worthington's office issued a memorandum concerning vocational education to all state departments of education: "within the limits of our authority" state vocational education agencies are directed to begin eliminating sex discrimination at once in vocational education. In May 1973, the Office of Civil Rights in HEW informed vocational schools of the provisions of Title IX of the Education Amendments of 1972.

Worthington praised teachers' organizations for calling the nation's attention to the problem of women in education. The American Federation of Teachers has recently given statistics of the numbers of women in various educational levels. Women comprise eighty percent of the nation's elementary school teachers, fifty percent of the secondary school teachers, twenty-five percent of the community college teachers, and only fourteen percent of the four-year college teachers. These statistics highlight an important problem in changing occupational attitudes of children, at the level where eighty percent of the teachers are women, as many of these teachers may not have the broad type of occupational attitude that "we would like to elicit in our young children."

Worthington viewed with concern a study by the National Center for Educational Statistics in the Office of Education, published in April, 1973, which reveals how much less women teachers earn than their male counterparts.

In conclusion, Worthington quoted from an article by Susan Margo Smith in *Essays on Career Education*:

"Above all, we must encourage them to grow conscious of themselves as women with many facets who have futures full of options."

Psychology and Counseling—
Helen Astin and
S. Norman Feingold

Helen Astin, then Director of Research and Education at University Research Corporation, Washington, D.C. (now Professor, Graduate School of Education, UCLA), summarized current research on the education and career development of women. She suggested that educators and employers use research knowledge to design creative ways to reverse the negative effects of the socialization process on girls.

Astin said, "If we examine the interests of young boys and girls, we find that the choices made by them very early in life are along traditional lines. . . . Boys by far prefer realistic (e.g., airplane mechanic, electrician, etc.) and investigative

(chemist, scientific researcher, etc.) types of occupations, and girls choose the social (social science, teacher, vocational counselor, etc.) and artistic (poet, cartoonist, etc.) occupations." Research indicates that young boys are aware of a greater number of options than are girls.

Other studies have shown that "there is an early tendency for girls to score higher on mathematical and spatial aptitudes, but these differences become significant only later on, around the onset of adolescence. This happens at about the same time as when both boys and girls begin to think more seriously about their future plans with respect to education and preparation for the world of work. This is a significant piece of information for all of us, not only in terms of our understanding of the developmental process, but also in providing critical information about any planned intervention in reversing some aspects of this process."

One study examining the development of mathematical aptitudes and interests found that the girls could not see any relationship between math and science courses and their lives after high school. "Somehow we have not been able really to properly assist young girls with their future education and career plans or to communicate to them about the variety of options and some of the realities about the role of work in the life of American women."

Astin cited two studies of determinants of career choices among women, the first examining the choices of high-school girls, and the second the choices of young women between twelfth grade and five years after high school. "In both studies, we found that one of the best predictors of career orientation in women is a high aptitude in mathematics. . . . We find that girls who pursue further educational training, who do plan for a future life in which a career plays an important role, early in their lives show an exceptional aptitude in mathematics. Another finding that puzzles us is that if we look at the kinds of major field choice and specialization for college women and for women in graduate study, we find that a high proportion of them major in mathematics compared to the proportions that undertake other 'hard science' fields."

"A possible relationship between math and artistic and aesthetic interests or an aesthetic quality about math might account for the attractiveness of math as a field of study for women with aesthetic or artistic interests and aptitudes." Since Astin believes that math is such an important course area and skill for later educational progress and career development, she suggested that we might introduce math in such a way that it would appeal to the aesthetic interests of girls. "Perhaps we should consider advising and sometimes even requesting that high-school girls register for courses in math and science, as the choice of electives seems to work better for boys, who are more likely than girls to select math or science."

Regarding the importance of role models, Astin said, "If we were to look closely at the figures that have had a strong influence on women who are successful professionally, it appears that there has been a male figure in their lives who has given them 'permission' or encouragement to become actualized. . . . usually a father or a brother or a male teacher or a male counselor." She suggested that male high-school counselors be sensitized to this fact.

"Some of the issues of concern to women and employers center on the workload and the full- versus part-time patterns of employment. The system tends to ask women to accommodate to existing limits and demands. . . . We have set certain standards and have certain expectations of *when* and *how* work should be done that penalize women who have home and family responsibilities. However, if we were to introduce flexibility into the system in order to accommodate women *only*, with their special needs for child care, we may be perpetuating the sex roles stereotypes. That is, only women now go home to take care of kids after school, or to take them to the doctor, rather than *either* parent.

S. Norman Feingold, National Director, B'nai B'rith Career and Counseling Services, and President, American Personnel and Guidance Association (APGA), outlined some specific steps for making guidance of girls in secondary schools more effective:

Accelerate the use of women who have successfully fulfilled the triple roles of wife, mother, and careerist as models for girls in career conferences, group guidance sessions, etc.

Plan more sophisticated trips to industry, where girls see women in a wide variety of jobs, particularly those that are classified as "pioneer."

Schedule more individual and small-group counseling sessions so girls may more

clearly perceive their educational and vocational options. He cautioned, however, that "Male counselors need to examine in depth their own hangups in relation to counseling girls at the high-school level. . . . Counselors, themselves, need to know more about the realities women face."

In his opinion, "the world of work must be introduced to youngsters in the early elementary grades. . . . The self-concept of many girls gets off to a bad start in their early school experiences. Too often, the bright girl today hides her brains and believes she is at a disadvantage if she shows them."

Counselors and educators should encourage girls to enter all courses of interest to them, regardless of the number of males or the nature of the course. "In sculpture, girls are not usually taught welding and other accompanying manual skills that are essential if they are to really move ahead in this field. This example can be multiplied in many areas." Yet, research indicates that skills enhance motivation.

Particularly for girls from low socio-economic groups and those disadvantaged in one way or another, school curricula need to be more relevant. "Too often, the relationship between studies and possible lifetime careers has been diluted to such an extent that a girl who has outstanding ability in mathematics, for example, may not even realize that math is related to engineering or carpentry."

As for materials used in career education, Feingold pointed out three problem areas:

Dissemination and improvement of occupational materials for secondary school youth, particularly for girls. "The creators of occupational information, as well as those who disseminate this information, have a tremendous obligation to see that it is effectively utilized." Our libraries need to be active resource centers of learning, but, he pointed out, often the few books available in relation to careers are too old to be of any use.

Educational and vocational information materials of all kinds. "Textbooks on careers and education and vocational information . . . should have much more information on pioneer careers for girls and women. They should detail how these women achieved their career objectives and can include latest information about work, cultures, life styles, career choices, and decisions. To date, audio-visual aids are primarily oriented towards males or stereotyped female roles such as secretary, stewardess, and telephone operator.

The paper blizzard of occupational literature. Much of this material is turning off, rather than turning on, girls, and accredited agencies should control it. Some career publications contain information that may be harmful, and "certain career briefs and information booklets which are available at no cost have far more appropriate material than those for which you have to pay."

Feingold urged counselors to "meet and acquaint themselves in depth with people from industry, their needs and problems, and ways in which they can work more closely together." Too few counselors have had meaningful work experience other than teaching. "We are repeatedly made

aware that most counselors are more cognizant and comfortable with career information on college careers than those in the blue-collar world."

When asked if the guidance function should be limited to guidance professions, Feingold's answer was "No. Too often the counselor tries to accomplish goals alone. The counselor should serve as a member of a team. This is often said in theory, but not carried out in practice. If counselors work in a school setting, they work with teachers, nurses, coaches, principals, superintendents. . . . In essense, they work with everyone who is part of the school system. The guidance function can be considerably enhanced by trained para-professional counselor aides and the use of peer counselors, who supplement and complement the work of professional counselors by allowing them to do those tasks for which they are trained. . . . Here again the use of 'living models' and lay career advisors may be helpful in the guidance function."

By re-emphasizing the family's role, the discontinuity between the child and the adult world of work in the U.S. may be lessened. Courses for parents that are conducted by professional counselors at many community centers are one approach that B'nai B'rith Career and Counseling Services has initiated.

The APGA has plans for some follow-up projects and demonstration programs that will help overcome the reluctance too often shown by girls at the high-school level toward technical and scientific work, but funding is a problem.

Feingold believes that the APGA should take a strong position on women's rights. Women must be alerted as to types of discrimination so they will know the realities of what is taking place in society, and the APGA can counsel women about how to deal with discrimination by providing workshops and seminars.

In conclusion, Feingold said that: "Change, as we know, is usually a slow process. To effect the changes mentioned here, they must occur simultaneously on all levels: educational systems, course offerings, educators, counselors, support personnel, employers, organizations, unions, government, parents, culture. . . ."

6 Information Resources and References

The editor of this publication, as will its readers, coped with selecting from a veritable flood of literature and of organizations relevant to some aspects of the education and/or employment of women. Finally, the decision was to include names and addresses of only a few national organizations that are centralized information sources. Following the list of organizations are general references restricted to those given "honorable mention" by speakers or moderators.

Organizations

In addition to those organizations named here, occupational and professional groups, technical schools, universities, and community service organizations are developing women's caucuses, counseling services, and programs to recruit women. Governmental, state, and local education, . . . manpower and equal opportunity agencies as well as women's organizations can also provide career information and services.

Most of the following organizations will provide brochures describing their services and publications. They may be able to suggest appropriate sources for inquiries about specific careers and career planning.

American Association for the Advancement of Science
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036

American Council on Education
One Dupont Circle
Washington, D.C. 20036

American Personnel and Guidance Association
1607 New Hampshire Avenue, N.W.
Washington, D.C. 20009

Association of American Colleges
Project on the Status and Education of Women
1818 R Street, N.W.
Washington, D.C. 20009

B'nai B'rith Career and Counseling Services
1640 Rhode Island Avenue, N.W.
Washington, D.C. 20036

Business and Professional Women's Foundation
2012 Massachusetts Avenue, N.W.
Washington, D.C. 20036

College Placement Council, Inc.
P.O. Box 2263
Bethlehem, Pennsylvania 18001

Conservation of Human Resources Project
Columbia University
New York, New York 10027

ERIC Clearing House on Vocational and Technical Education
The Center for Vocational and Technical Education
The Ohio State University
1900 Venny Road
Columbus, Ohio 43210

International Association of Counseling Services, Inc.
1607 New Hampshire Avenue, N.W.
Washington, D.C. 20009

National Foundation for the Improvement of Education
Resource Center on Sex Roles in Education
1507 M Street, N.W.
Washington, D.C. 20036

National Organization for Women
1957 East 73rd Street
Chicago, Illinois 60649

Scientific Manpower Commission
1776 Massachusetts Avenue, N.W.
Washington, D.C. 20036

U.S. Civil Service Commission
The Federal Women's Program
Washington, D.C. 20415

U.S. Office of Education
Department of Health, Education and Welfare
Bureau of Occupational and Adult Education
Office of Career Education
Washington, D.C. 20202

U.S. Department of Labor
Employment Standards Administration
Women's Bureau
Washington, D.C. 20210

Society of Women Engineers
United Engineering Center
Room 305
345 E. 47th Street
New York, New York 10017

Women's Equity Action League
538 National Press Building
Washington, D.C. 20004

Women in Science and Engineering,
Boston, Massachusetts
c/o Margaret E. Law
Physics Department
Harvard University
Cambridge, Massachusetts 02138

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Carnegie Commission on Higher Education
1947 Center Street
Berkeley, California 94704

College Graduates and Jobs: Adjusting to a New Labor Market Situation. McGraw-Hill, 1973.

Opportunities for Women in Higher Education. McGraw-Hill, 1973.

Priorities for Action: Final Report of the Carnegie Commission on Higher Education 1973. McGraw-Hill, 1973.

Center for Human Resource Research
The Ohio State University
Columbus, Ohio 43210

Kim, Sookon; Roger D. Roderick, and John R. Shea. *Dual Careers: A Longitudinal Study of Labor Market Experience of Women.* Vol. 2, September 1972.

Roderick, Roger D. with the assistance of Joseph M. Davis. *Years for Decision: A Longitudinal Study of the Educational and Labor Market Experience of Young Women.* Vol. 2, March 1973.

The Conference Board
845 Third Avenue
New York, New York 10022

Rhine, Shirley H. *Technician Education—Who Chooses It?* 1972.

Shaeffer, Ruth G. *Nondiscrimination in Employment: Changing Perspectives, 1963-1972.* 1973.

Economic Report of the President. Transmitted to the Congress, January 1973. U.S. Government Printing Office, Washington, D.C. 1973.

General Electric Company
Corporate Equal Opportunity/Minority Relations
570 Lexington Avenue
New York, New York 10022

"General Electric Efforts to Increase the Supply of Minority Engineering Graduates."

"Women and Business: Agenda for the Seventies—Business Implications of Equal Rights for Women."

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Barbara L. Fifield
International Ladies Garment Workers
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Boston, Massachusetts

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